

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of June 7, 2006 is respectfully requested.

By this Amendment, claims 1-20 have been cancelled and new claims 21-40 have been added and are currently pending. No new matter has been added by these amendments.

In order to make editorial improvements, the entire specification and abstract have been reviewed and revised. Due to the number of revisions, the amendments to the specification and abstract have been incorporated into the attached substitute specification and abstract. For the Examiner's benefit, a marked-up copy of the specification and abstract indicating the changes made thereto is also enclosed. No new matter has been added by the revisions. Entry of the substitute specification is thus respectfully requested.

On pages 2-3 of the Office Action, the Examiner objected to the drawings for failing to show every feature of the invention specified in the claims. In particular, the Examiner asserted that the "drawer" and the "article of furniture" must be shown or cancelled from the claims. As indicated above, claims 1-20 have been cancelled and replaced with new claims 21-40, and the new claims do not recite a "drawer" or an "article of furniture." Therefore, in view of the cancellation of these features from the claims, it is respectfully submitted that the Examiner's objection to the drawings is no longer applicable.

On page 3 of the Office Action, the Examiner rejected claims 1-20 under 35 U.S.C. § 112, first paragraph, for containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make or use the invention. In particular, the Examiner asserted that it was unclear how various components of the invention were attached to the "drawer" or to the "article of furniture." However, as discussed above, claims 1-20 have been cancelled and replaced with new claims 21-40, which do not recite a "drawer" or an "article of furniture." Moreover, it is submitted that one of ordinary skill in the art would fully understand, based on the original disclosure, how to make and use the retraction device of new claims 21-40. Accordingly, it is respectfully submitted that the Examiner's rejection under § 112, first paragraph, is no longer applicable to the new claims.

On pages 3-6 of the Office Action, the Examiner rejected claims 1-20 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner asserted that the claims

contain phrases which render the scope of the claims vague and indefinite, that the claims omit essential elements, and that several of the limitations lack antecedent basis. In order to address these formal rejections, and in order to place the original claims in a proper form according to U.S. practice, the original claims have been cancelled and replaced with new claims 21-40, and the new claims have been drafted so as to fully comply with all the requirements of 35 U.S.C. § 112. Therefore, it is respectfully submitted that the Examiner's formal rejections under § 112 are not applicable to the new claims.

On page 6 of the Office Action, the Examiner rejected claims 1, 2 and 4 under 35 U.S.C. § 102(b) as being anticipated by Blum (DE 202 17 975). However, as indicated above, claims 1-20 have been cancelled and replaced with new claims 21-40. For the reasons discussed below, it is respectfully submitted that the new claims are clearly patentable over the prior art of record.

The discussion of the invention provided below makes reference to the specification and figures of the present application. However, these references are made only for the Examiner's benefit, and are not intended to otherwise limit the claims.

New independent claim 21 recites a retraction device which, as for example is shown in Figs. 1-5, includes a holding member 6 to be fixed to an extension rail 3, and an entrainment member 12 releasably coupled to the holding member 6. The retraction device further includes a first spring 14 having a first end fixed to the entrainment member 12, and a second end to be anchored to a carrier rail 2. The retraction device also includes a second spring 15 having a first end *releasably coupled* to the entrainment member 12, and a second end to be anchored to the carrier rail 2. Further, the retraction device includes *a releasing mechanism for releasing the first end of the second spring 15 from the entrainment member 12 while the entrainment member 12 moves along a path of movement.*

Blum discloses a retraction device which, as shown in Figs. 1-7, includes an entrainment member 12 and two springs 14. The springs 14 are anchored at one end 15 and are connected to the entrainment member 12 at the other end. On page 6 of the Office Action, the Examiner notes that it "is inherent that the springs or a spring can be releasably coupled to the entrainment member since a person can remove or insert the springs manually." However, Blum does not disclose that a first end of one of the springs is releasably coupled to the entrainment member, and that *a releasing mechanism releases the first end of the spring from the entrainment member*

while the entrainment member moves along a path of movement, as required by new independent claim 21. Rather, as shown in Figs. 6 and 7, Blum discloses that both springs 14 remain attached to the entrainment member 12 along the entrainment member's full path of movement.

Therefore, Blum does not disclose a releasing mechanism for releasing the first end of one of the springs from the entrainment member while the entrainment member moves along a path of movement.

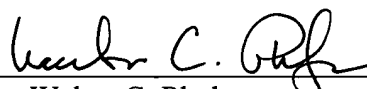
Therefore, it is respectfully submitted that new independent claim 21, as well as claims 22-40 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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Version with Markings to
Show Changes Made

RETRACTION DEVICE FOR DRAWERS

Description

FIELD OF THE INVENTION

The invention relates to a retraction device for drawers or the like comprising a displaceable entrainment member which is subjected to the force of at least two springs and which can be releasably coupled to a holding member secured to a portion of an article of furniture.

A retraction device of that kind is known from German utility model DE 202 17 975 U.

SUMMARY OF THE INVENTION

The object of the invention is to improve a retraction device of that kind, such that it has a more uniform retraction characteristic and also a retraction capability which is still strong in the last range of closing movement.

The object according to the invention is attained in that at least one of the springs can be releasably coupled to the entrainment member and at least one spring is constantly connected to the entrainment member.

It is advantageously provided that the springs are of an unequal length.

In general a drawer of that kind will be provided with two springs. When the drawer is pulled out firstly both springs are stressed, then the shorter spring is unlatched from the entrainment member and anchored in the stressed condition in the housing in which the entrainment member is displaceable. Upon further extension movement of the drawer, the longer spring is then alone further stressed until that spring, together with the entrainment member, is anchored in a stressed condition in the housing. The drawer can then be freely pulled further out of the body of the article of furniture.

When the drawer is pushed in, the holding member comes into engagement in a known manner at the entrainment member, releases it from its anchored condition on the housing and the drawer is first pulled into the body of the article of furniture only by one spring. The stress in the spring decreases over the retraction travel distance. When the stress

in the spring has reached a predetermined lower value the second spring is coupled to the entrainment member and the drawer is now pulled into the body of the article of furniture by both springs jointly. The drop in spring stress or the drop in force in respect of the first spring is compensated by the use of the second spring.

A further embodiment of the invention provides that the entrainment member is mounted on a linearly displaceable slider which is engaged by a coupling member which is fixedly connected to at least one spring. Mounted in the coupling member is a rocker member which serves as a locking member and which arrests the coupling member on the one hand to the slider and on the other hand to the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention is described hereinafter with reference to the Figures of the accompanying drawings in which:

Figure 1 is a diagrammatic perspective view of an extension guide fitting with a retraction device according to the invention,

Figure 2 shows an end view of a retraction device according to the invention, Figure 3 shows a plan view of a retraction device according to the invention, Figure 4 is a view of the retraction device according to the invention seen from below,

Figure 5 shows an exploded perspective view of the retraction device according to the invention,

Figures 6 through 9 show views in longitudinal section through the retraction device according to the invention, the entrainment member and the coupling member being shown in various positions,

Figures 10 through 12 show perspective views of the retraction guide fitting according to the invention, corresponding to sections 6 through 9,

Figure 13 shows a perspective view of the retraction device according to the invention seen from below, the entrainment member being shown at the rearmost end of the retraction travel distance,

Figure 14 shows the same perspective view as Figure 13, with the entrainment

member being shown during the displacement travel,

Figure 15 shows the same perspective view as Figures 12 and 13, the springs being stressed and the entrainment member being shown in its readiness position,

Figure 16 shows a perspective view of the retraction device, the movable members being shown separately, with the exception of the springs, and

Figure 17 diagrammatically shows the function of the retraction device according to the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In the illustrated embodiment the retraction device 1 is mounted on the carrier rail 2 of an extension guide fitting. The carrier rail 2 is to be secured to a side wall of a body of an article of furniture in a conventional manner. An extension rail 3 is secured to each side of the drawer. Arranged on the extension rail 3 at the drawer side is a downwardly projecting entrainment pin 6 forming the holding member with which the entrainment member 12 of the retraction device 1 can be releasably coupled.

The retraction device 1 has a housing 7 which is anchored on a horizontal limb of the carrier rail 2. The arrangement also has an anchoring member 5 for ~~the first and second~~ springs 14, 15, which is also anchored on the horizontal limb of the carrier rail 2. Upon being mounted on the carrier rail 2, the housing 7 and the anchoring member 5 are spaced from each other. The spacing between the housing 7 and the anchoring member 5 determines the stress of the springs 14, 15 and thus the retraction force of the retraction device 1. The ends of the springs 14, 15 are fixedly connected to the anchoring member 5.

The entrainment member 12 of the retraction device 1 is mounted on a ~~carriage-slider~~ 8 which is arranged displaceably in the housing 7, and is in the form of a tilting member. The entrainment member 12 has a projection, by means of which it is guided on a guide track of the housing 7.

The ~~two first and second~~ springs 14, 15 are anchored on ~~the one hand-end~~ to the anchoring member 5 and on the other ~~hand-end~~ to the ~~carriage-slider~~ 8. The spacing of the anchoring member 5 from the housing 7, as stated above, determines the stress of the springs 14, 15. The housing 7 is of a U-shaped cross-section and in the mounted condition covers the

springs 14, 15 partially and the ~~carriage~~slider 8 entirely.

The illustrated embodiment has two springs 14, 15 which are in the form of coil tension springs and which are disposed in a mutually juxtaposed relationship in a plane which is parallel to the mounting plane of the housing 7. The term mounting plane is used to denote the plane in which the housing 7 is supported on the horizontal limb of the carrier rail 2.

When a stronger retraction force is required, it is also possible to use three ~~and or~~ more springs. The height (the dimension ~~perpendicularly perpendicular~~ to the horizontal limb of the carrier rail 2) of the housing 7 remains unchanged, and for that reason the retraction device 1 can also be installed in very low extension guide fittings.

The first spring 14 remains constantly connected to the ~~carriage~~slider 8 (and, therefore, to the entrainment member 12). The second spring 15, however, is releasably coupled to the entrainment member 12 by a releasing mechanism including a coupling member 4, a rocker member 10, and the slider 8. Specifically, the second spring 15 is anchored ~~in to a the~~ coupling member 4, on which a ~~the~~ rocker member 10 of the releasing mechanism is mounted tiltably on a spindle 9.

The rocker member 10 has two latching noses 16, 17. The latching nose 16 is 5 provided with an abutment surface 18.

The rocker member 10 couples the coupling member 4 either to the carriage 8 or to the housing 7.

In Figures 6, 10 and 17 the parts of the retraction device are anchored in the initial position, that is to say the springs 14, 15 are relieved of stress and the second spring 15 is connected to the ~~carriage~~slider 8 by way of the coupling member 4 of the releasing mechanism and the rocker member 10. The holding member 6 of the extension rail 3 is anchored in the entrainment member ~~212~~.

If now the drawer and thus the extension rail 3 are pulled out of the body of the article of furniture, the holding member 6 pulls the entrainment member 12 together with the ~~carriage~~slider 8 and the coupling member 4 anchored thereon in the direction of the arrows A in Figures 6, 10 and 17, the springs 14 and 15 being stressed. In that case the rocker member 10 of the releasing mechanism is engaged with the latching nose 17 at a holding surface 22 of the ~~carriage~~slider 8. The rocker member 10 is held in that position by the upper closure wall

7' of the housing 7.

The housing 7 has an opening 20 in its upper closure wall 7'. As soon as the latching nose 16 is below that opening 20, the rocker member 10, by virtue of the force which acts on the latching nose 17, is tilted in the clockwise direction and, as shown in Figure 8, the latching nose 16 latches in the opening 20, in which case the abutment surface 18 bears against a counterpart surface 21 of the opening 20 or the housing 7.

Due to that rotary movement of the rocker member 10 of the releasing mechanism, the latching nose 17 releases the holding surface 22 and the ~~carriage~~-slider 8 is uncoupled from the coupling member 4 while the coupling member 4 is anchored by way of the rocker member 10 to the housing 7. The second spring 15 is so-to-speak parked in the stressed position. The entrainment member 12 and the ~~carriage~~-slider 8 are moved further, in which case the first spring 14 is further stressed. As soon as the entrainment member 12 has reached its end position, it is pivoted by virtue of the angled configuration of the control track in the housing 7 and releases the holding member 6. The drawer is now moved freely along the carrier rails and the retraction device 1 remains in the readiness position.

When the drawer is closed and the holding member 6 latches in the opening 23 of the entrainment member 12, the entrainment member 12 is tilted out of its latching position and pulled by way of the ~~carriage~~-slider 8 by the first spring 14 into the body of the article of furniture. During the retraction travel the tension and thus the force of the first spring 14 decreases. When the ~~carriage~~-slider 8 has reached the position shown in Figure 8 the nose 24 of the ~~carriage~~-slider 8 bears against a counterpart surface 25 of the rocker member 10 of the releasing mechanism and the latching nose 16 of the rocker member 10 is urged out of the opening 20, in which case the holding effect between the abutment surfaces 18, 21 is nullified. At the same time the latching nose 17 of the rocker member 10 engages behind the holding surface 22 of the slider 8 and the coupling member 4 of the releasing mechanism is thus coupled by way of the rocker member 10 to the slider 8. The second spring 15 now also acts on the slider 8 and thus on the entrainment member 12 and the drawer is pulled jointly by the springs 14, 15 into the body of the article of furniture, into its rearmost position. The loss of stress in the first spring 14 over the retraction travel distance is cancelled out by the second

spring 15 being brought into effect and the drawer is very uniformly pulled into the body of the article of furniture.

In its front region the coupling member 4 is of a U-shaped cross-sectional configuration and in that region the rocker member 10 is mounted on a spindle 9.

In the illustrated embodiment the retraction device 1 is arranged on the stationary carrier rail 2 and the entrainment pin 6 is arranged on the extension rail 3 which is towards the drawer. The reversed arrangement, that is to say the retraction device 1 on the extension rail 3 and the entrainment pin 6 on the carrier rail 2, would also be possible.

Abstract

A retraction device for drawers ~~comprising~~ includes a displaceable entrainment member (12) which is subjected to the force of two springs (14, 15) and which can be releasably coupled to a holding member (6) secured to a portion of an article of furniture. One of the springs (15) can be releasably coupled to the entrainment member (12) and one spring (14) is constantly connected to the entrainment member (12).

~~(Figure 17)~~